

REMARKS

Claims 1, 3, 5 and 10-14 are all the claims pending in the application.

Claim Rejections Under 35 U.S.C. § 103

Claims 1, 3, 5 and 10-14 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Nano-aggregates of single-walled graphitic carbon nano-horns by Iijima et al., in view of by Ohsaki et al. (U.S. Patent No. 6,878,360; hereinafter “Ohsaki”) and Suzuki et al., (U.S. Patent No. 6,648,975; hereinafter “Suzuki”).

Applicants respectfully submit that it would not have been obvious to modified Iijima as proposed by the Examiner to include a moistening unit in the recovery chamber based upon Ohsaki and Suzuki for at least the following reasons.

Iijima merely discloses a particular type of carbon particle produced using the laser ablation method (see Abstract). The method uses a nano-horn generator including a laser source, a reaction chamber, and a graphite target in the chamber (Iijima, Section 2. Experimental). Gas flows through the chamber and through a collection filter which collects the product (Iijima, Section 2. Experimental).

Suzuki discloses a laser ablation method of producing a structure having ultra-fine particles distributed in a transparent medium that includes a depositing chamber 103 wherein the ultra-fine particles and the transparent medium are simultaneously deposited onto a substrate (see Abstract).

On the other hand, Ohsaki discloses a method of producing carbon fibers that uses a furnace as opposed to using a laser ablation method.

As Applicants have previously argued, the method of producing carbon fibers using a furnace (as in Ohsaki) and the method using laser ablation (as in Iijima, Suzuki, and the presently claimed invention) are fundamentally different methods that pose their own unique characteristics. In fact, Suzuki discloses that it is known that the physical properties of ultra-fine particles having diameters from a few to a few tens of nanometers vary depending on the particle diameter (column 4, lines 52-55). The laser ablation method produces carbon nanohorn assemblies that are low density and therefore presents its own problem in that the nanohorn assemblies produced by this method are difficult to recover by depositing on a substrate because they float in the air (see present application, page 2). One of ordinary skill would not have looked to an apparatus wherein the carbon fibers fall downwardly and are sucked into a collection means to solve a problem caused by the fibers floating and drifting.

For the above reasons, Applicants respectfully submit that it would not have been obvious to modify Iijima to include a moistening unit in a recovery chamber, as required by claim 1.

Applicants respectfully submit that independent claim 11 is patentable for at least the same reasons as claim 1.

Claims 3, 5, 10, and 12-14 should be patentable at least by virtue of their respective dependencies on one of claims 1 and 11.

Furthermore, regarding claim 14, the Examiner alleges that if one skilled in the art wanted to provide the laser light of Suzuki along a straight horizontal line, one of ordinary skill would have understood that given the constant illuminating angle and thus the generated plume's

direction, the recovery chamber would have to be above the generation chamber (Office Action, page 5).

Firstly, Applicants respectfully submit that there is no evidence in the record as to why one of skill in the art would be motivated to place the laser light along a straight line. Secondly, even if one or ordinary skill wanted to place the laser light along a straight horizontal line, the recovery chamber is not necessarily required to be positioned above the generation chamber. For example, if the center of the graphite target rod were positioned vertically above the line of the laser light source, the plume would in fact be directed in a downward direction, and the recovery chamber, in order to be aligned with the plume, would be positioned below the generation chamber.

Accordingly, claim 14 should be separately patentable for the features recited therein.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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